Analysis of the learning gap between indigenous and non-indigenous in primary education in Mexico

*Emilio Blanco**

Abstract

The objective of this article is to estimate the relative weight that - on the disadvantage of learning of indigenous students of primary education in Mexico - have socioeconomic, school and cultural factors. For this, hierarchical-linear and Oaxaca-Blinder models are specified to analyze and decompose the learning gap between indigenous and non-indigenous students, on the microdata of the National Plan for the Evaluation of Apprenticeships (PLANEA) 2015. The main results are: 1) besides the differences between individuals, an important part of the differences is explained by the percentage of indigenous students in the schools (composition effect); 2) these differences are significantly reduced when controlling for socioeconomic and school factors (especially, for the former); 3) although socio-economic factors account for most of the gap, students' school trajectories and the characteristics of the schools they attend acquire greater weight to explain the differences in mathematics, and the specific disadvantage of the students. students who first learned an indigenous language.

Keywords : Learning gap, indigenous population, primary education.

Introduction

The indigenous population in Mexico lives in substantially lower conditions than the rest of the inhabitants. Regardless of the identification criteria adopted 1 , indigenous people present figures of extreme poverty and social deprivation between two and four times higher than those of the non-indigenous population, to the point that almost all indigenous people are poor or vulnerable (National Council for the Evaluation of Development Policy Social [CONEVAL] 2014). The educational disadvantage of indigenous people is a central dimension of this situation of marginalization; the gaps between indigenous people and the rest of the population have only been equated in access to the primary level (National Institute for the Evaluation of Education [INEE] 2016a). In the rest of the indicators (access to secondary, upper and tertiary levels, lag, reprobation, abandonment) the lag persists (INEE , 2016a).

If the educational results are considered, the National Plan for the Evaluation of Learning (Plan, 2015) shows that while nationally the percentage of students located at insufficient levels of learning reaches 49.5 and 60.5% (Language and Mathematics, respectively) , among

the students who attend indigenous schools these figures are, respectively, 80 and 83% (INEE , 2016a). Explaining these differences in learning is the objective of this article; specifically, I seek to break down these differences to determine which part can be explained by different groups of factors, in order to contribute to the discussion about the mechanisms involved in the production of educational inequality.

Broadly speaking, it is possible to identify five explanations, not excluding, about the disadvantage of indigenous learning.

The first explanation is based on the robust relationship between socioeconomic factors and learning (Cervini 2012, Fernández 2007), which makes the former obvious candidates. Under this scenario, controlling the initial gaps for a battery of socioeconomic factors should substantially reduce them. The main general hypothesis that sustains this article is, indeed, that socioeconomic factors manage to explain most of the learning gaps; In other words, these gaps respond more to the differences in the material and educational resources of the groups analyzed, than to processes of discrimination or cultural irrelevance of school models.

Second, it highlights the inequality in the characteristics of the schools attended by indigenous and non-indigenous students. This explanation emphasizes the deficiencies in infrastructure (INEE , 2016b), the incomplete or multi-grade organization of many of these schools (INEE , 2016a), or the lower level of teacher training (INEE , 2015, Santibáñez 2016, Schmelkes, 2013) . Although this explanation can be forced within a scheme of "systemic discrimination", I consider that it is more appropriate to consider it an institutionalized expression of resource disadvantage.

The third explanation is the lack of relevance and cultural relevance of the educational model implemented for indigenous students. Despite the fact that in the last decades "assimilating" approaches have been abandoned in favor of a bilingual intercultural model (Bertely 2002), the difficulties in their practical implementation in indigenous schools (Bastiani et al., 2012; Tinajero and Englander, 2011), as well as the fact that many indigenous students attend general-purpose schools, end up -according to this theory- in exposure to irrelevant models, which end up alienating students from learning processes.

Fourth, the discrimination suffered by indigenous students within schools, especially in non-indigenous schools, has been emphasized. Numerous authors have documented the invisibilization and / or inferiorization of which they are object by teachers and classmates, which generates feelings of shame, school discomfort, and attitudes of withdrawal (Barriga 2008, Mijangos-Noh 2009, Raesfeld 2009, Schmelkes 2013) . If this discrimination is effectively translated into learning inequalities, there should be a significant gap between indigenous and non-indigenous, despite controlling for socioeconomic and school factors; Another indication of discriminatory practices could be a larger gap in general schools than in indigenous schools.

The fifth explanation is simply that indigenous students are being evaluated on (and, in the case of language tests, on) a language of which they do not have a domain comparable to that

of native Spanish speakers (Treviño, 2013). While it seems common sense, the scant empirical research available shows that this may not always be the case. two In the context of this research, a favorable element of this theory should be a greater gap in language than in mathematics, both before and after introducing statistical controls.

Leaving aside the last hypothesis, the first two could be called "structural", while the next two could be called "cultural". Although the basic hypothesis of this article is that the former obtain more empirical support than the latter, two aspects must be taken into account:

There are no variables to directly evaluate "cultural" hypotheses, so it is necessary to resort to assumptions to support their indirect observation. It could be assumed, for example, that the totality of the remaining gaps after controlling for the "structural" variables could be attributed to "cultural" mechanisms; however, the possibility of unobserved structural variables that affect learning suggests taking the remaining gap as a "maximum" estimate of cultural effects.

The separation between structural effects and cultural effects can not necessarily be made in a clear way, since there can be interactions between them (for example: indigenous students could suffer greater discrimination the lower their socioeconomic position).

Research for Latin America shows considerable variations in the gaps and the explanatory capacity of different factors, depending on the countries studied, the data used, and the learning areas considered. The above justifies the effort to deepen this line of research.

In a review of studies, McEwan and Trowbridge (2007) report differences of 1.1 to 0.2 standard deviations, depending on the country and area evaluated. For the primaries of Guatemala, specifically, the authors showed significant decreases in the gaps, once socioeconomic variables and school effects were controlled. The characteristics of schools, in particular, would explain about two-thirds of the gaps; finally, between 24 and 45% of them remain unexplained. On the other hand, a study for the primary level of Peru showed learning gaps between 0.5 and 1.2 standard deviations, which were almost completely explained by socioeconomic factors (Sakellariou, 2008). Similar reductions have been reported in Bolivia and Chile, for initial differences between 0.3 and 0.5 standard deviations (McEwan, 2004). In a study on Guatemala, Peru and Mexico, Hernández-Zavala, Patrinos, Sakellariou and Shapiro (2006) reported, for this last case, gaps of 0.7 standard deviations in Spanish and mathematics, which are reduced by 70% when controlling for individual variables and schoolchildren (especially the first ones).

The only study in Mexico that recurs to a methodology of breakdown of gaps (specifically, for the state of Chiapas) was published by Santibáñez (2016), who found that the socioeconomic characteristics of students explain 60-70% of the differences between indigenous and not indigenous.

II. Method

For the analysis of the data, multilevel models were used (Raudenbush and Bryk, 2002) and Oaxaca-Blinder (OB) decompositions (Blinder, 1973, Oaxaca, 1973). In both cases, we start from an initial (or gross) gap between indigenous and non-indigenous learning, in order to explain it statistically by introducing variables and identify which proportions of the explanation correspond to different groups of factors.

The data comes from the Planea 2015 test for the sixth year of primary school. Only cases with complete information were included, so that the final sample sizes were 80,080 individuals and 2,735 schools for the multilevel models. 3 , and 81,389 individuals and 2,952 schools for OB decompositions. 4

Although variables are not available to observe phenomena such as discrimination or the cultural irrelevance of the educational model, in principle it would be possible to indirectly estimate the effects of eventual processes of this type. Usually, the proportion of the gap not explained by the OB models is taken as a general indicator of discrimination (McEwan, 2004), because it points to differences in the returns of the resources or experiences of both groups (as opposed to explained differences). due to differences in resources and experiences). However, since there are potentially relevant variables not included in the model, coupled with the aforementioned disadvantage of solving tests in Spanish, as well as the possibility that the observed variables can only be considered proxies of the relevant factors (for example, the educational level of the parents does not indicate the quality of the education acquired), it seems more cautious to interpret this proportion as a "maximum possible ceiling" for the eventual effects of cultural discrimination / irrelevance.

Beyond this, and for reasons that are exposed in the conclusions, this paper argues that for learning inequalities even this interpretation is risky. The complexity of the factors involved does not allow a clear distinction between "resource effects" and "yield effects". However, the OB method allows to separate groups of factors with certain clarity, so that the plausibility of some explanatory mechanisms can be evaluated.

The dependent variables in the models are the standardized scores of the language / communication and mathematics tests. The independent variables are divided into individual level variables and school level variables. 5

At the individual level, the following variables were used:

Alumno first learned an indigenous language: 0 = No; 1 = Yes

Student is considered indigenous: 0 = No; 1 = Yes 6

Student is Female: 0 = No; 1 = Yes

Goods in the student's home: tetrachoric factorial index of goods in the home (electricity, gas, telephone, television, pay television, Internet, computer, washing machine, refrigerator, microwave, DVD or Blu-Ray, automobile or van).

Maximum educational level of the student's parents: 0 = Until primary; 1 = Secondary or baccalaureate; 2 = University or more.
Student's employment status: 0 = Does not work; 1 = Work at home; 2 = Work outside the home.
Preschool attendance: 0 = Did not attend; 1 = 1 year; 2 = 2 years; 3 = 3 years.
He failed some degree: 0 = No; 1 = Yes
Educational expectations: 0 = Going through high school; 1 = Take a university; 2 = Postgraduate course.
Classroom climate perceived by the student: polychoric factorial index based on the following questions: "My teacher ... i) Take into account my opinions during the classes"; ii) It gives me confidence to ask my doubts in class "; iii) Organize activities in which we can give our opinion and listen to those of others "; iv) Take into account our opinion about the rules in the classroom. "
At the school level, the variables were:
School modality: 0 = General public; 1 = Indigenous; 2 = Private.
Grade evaluated is multigrade: 0 = No; 1 = Yes
Principal of the school has a group in charge: 0 = No; 1 = Yes
Lack of educational materials in the school: polychoric factorial index based on the existence and sufficiency of furniture and materials (furniture for sitting and writing, reading and consulting books, computers or tablets, televisions, video players).
Percentage of students who speak an indigenous language (average of # 1).
Percentage of students who identify themselves as indigenous (average of # 2).
School average of assets in the students' home (average of # 4).
Average classroom climate (average of # 10).
High educational expectations of teachers towards students (dichotomous variable: 1 = All teachers interviewed expect their students to access the tertiary level, 0 = All other cases).

III. Results

3.1 Descriptive

In the sample used for the analyzes, 13.1% of the children self-identify as indigenous and 2.4% declare to have learned an indigenous language first. 7 Table I shows the distribution of the relevant variables for each group.
Although the probability of being in an indigenous school is greater for both groups than for non-indigenous students, 77.3 and 49.1% of the auto-writings and speakers, respectively, are in regular schools. Likewise, 59.9 and 38.9% of both groups live in towns larger than 2,500 inhabitants. The majority of these children live in places of high or very high marginalization, unlike what happens with non-indigenous children

Indigenous students tend to come from households with lower levels of well-being and education; they have higher rates of disapproval, lower educational expectations and greater participation in situations of child labor. They also have a greater propensity to attend multigrade schools, schools where teachers have lower educational expectations for students, where the principal has a group in charge, and with greater shortages of educational materials. They also tend to attend schools with lower levels of socioeconomic composition. Particularly, it is the speaking population that shows the greatest disadvantages in these indicators.

In the last two rows of table I the averages of learning for the populations of interest are shown, expressed in the original scores. As can be seen, the gaps range from 61 to 75 points at the disadvantage of the speakers, and from 24 to 31 points at a disadvantage of the self-

subscriptions, respectively for mathematics and language. These are very important differences, especially in the case of speakers. To what extent the exposed social and school conditions manage to exhaust the explanation of the learning gaps? What can be said about the remaining gaps, in relation to the other explanations available? Next, the results of the analyzes are presented.

3.2 Hierarchical-linear models

Table II presents the results of the models for language / communication and mathematics. The main objective of this analysis is to show the starting points of the indigenous gaps, their reduction as different variables are introduced, and the possible existence of interactions between them. For reasons of space and simplicity in the presentation, only the relevant coefficients for this objective are shown. 8

Table II. Regression coefficients on learning outcomes for related variables with the ethnic condition of the student and the ethnic composition of the school, by area evaluate

Model 1 includes the effects of self-identification and indigenous speech (variables 1 and 2). 9 Model 2 adds the percentage of self-assigned and speaking students in the school (variables 15 and 16). The 3 includes socio-economic variables, school trajectory and the educational expectations of the student, as well as the school average of economic well-being (variables 3 to 9 and 17). The 4 adds the variables referring to the school: modality, resources, climate and expectations of teachers (variables 10, 11, 14, 18 and 19). 10 In model 5, the interactions between the ethnic condition of the student and the percentage of indigenous people in their school are added, with the two criteria (1x15 and 2x16).

If we look at the coefficients in Table II, model 1 shows that both those who speak an indigenous language and those who identify as indigenous have inferior results in both areas, and the disadvantage is greater for the former. No significant differences were observed in the size of the gaps between the areas evaluated.

Model 2 shows that the percentage of students who speak an indigenous language in school has significant effects and is separate from the individual effects. This is relevant because it indicates that part of the gap is not generated between individuals but between schools, depending on how the students are composed. It is, in principle, effects of considerable magnitude: the disadvantage associated with attending a school with 32.2% of indigenous speakers (average of indigenous schools) vs a school with 1.5% of indigenous speakers (average of general schools) is of 0.28 standard deviations. On the other hand, the percentage of students who identify as indigenous does not produce significant effects in mathematics, and only has weak effects in language.

When the coefficients are controlled by the social and educational characteristics of the students, as well as by the socioeconomic composition of the schools (model 3), important changes are observed. In the first place, in both learning areas the negative effects of self-ascription and speech (particularly the latter) are reduced. The coefficients associated with the school percentage of students who speak an indigenous language are also reduced, which indicates that an important part of this gap could be explained by the differences in the socioeconomic composition of these groups. Finally, the percentage of those who identify themselves as indigenous in the school takes a positive sign, which could indicate the

presence of collective cultural dynamics, associated with the defense of an indigenous identity, with positive effects on learning. eleven

In model 4 (school variables), the change corresponds precisely to the coefficient associated with the percentage of students who identify themselves as indigenous, which is reduced in comparison with model 3. This suggests that part of the explanation of this effect would reside in that the percentage of indigenous self-identification in the school is associated with a better classroom climate and educational expectations of the highest teachers. 12

Finally, model 5 shows a significant, positive interaction in both areas, between the percentage of those who identify as indigenous in school and the individual self-identification. In the case of interaction for those who speak an indigenous language, it is only significant for mathematics, also with a positive sign. These results suggest that, once the effects of social origin are discounted, schools with a higher proportion of indigenous people tend to be more favorable for the learning of indigenous students, which could point to the existence of cultural discrimination phenomena that harm the indigenous students who are in a minority.

An exercise carried out based on the scores predicted by model 5 showed that the differences favorable to non-indigenous people in general schools tend to disappear in schools with a high presence of self-taught indigenous people, through the improvement of learning of both types of students, but mainly of those who identify as indigenous (keeping the rest of the factors constant). 13 The result is the inverse when the exercise is done for schools with a high proportion of speaking students: the learning of indigenous and non-indigenous people tend to descend for all, and especially for non-indigenous people, until they become statistically indistinguishable.

3.2 Oaxaca-Blinder Decompositions

The OB decompositions were made as separate contrasts between non-indigenous vs. self-written and non-indigenous vs. speakers, from models that incorporate the same variables of the hierarchical-linear 14 (see table III).

Table III. Gaps in learning among non-indigenous, indigenous by identification and indigenous by language, explained by linear models and broken down into explanatory components

The total proportion of the gap explained by the models (rows 3 to 5) is similar in both learning areas, and similar also for comparisons with indigenous people by identity and indigenous speakers;In general, the percentage explained moves in a high range, from 83 to 87%, which accounts for a good explanatory performance of the models. As in the hierarchical analysis of the previous section, the fact that there is no "extra" proportion not explained in language, or an "extra" proportion not explained to speakers, weakens the plausibility of the hypothesis related to the language of the test as an explanatory factor of the disadvantages of learning.

The analysis of the components explained for each gap (rows 6 to 9) reveals an interesting pattern. In general terms, it is the school environment that has the greatest explanatory weight, followed by the student's trajectory. The school and the individual social origin, on the other hand, have lower weights. However, the explanatory weight of the analyzed factors varies systematically depending on the area of knowledge and the type of contrast evaluated. The

factors of the social structure (social origin of the student and school social environment) have more weight in the language test than in the mathematics test, and more weight in the gap of the indigenous by self-identification than in the indigenous by language. Of these, the school environment (which includes the aggregate socioeconomic level and percentage of indigenous people) systematically shows a weight between two and three times greater than the individual socioeconomic factors.

Additionally, the student's school trajectory (preschool, failure and educational expectations) has a greater explanatory weight in mathematics than in language. School factors, on the other hand, also increase their weight in mathematics, and in contrast with indigenous speakers. The implications of these results are discussed below.

IV. Discussion

Although in Mexico there is no data available to directly evaluate the performance of all possible explanations for the handicap of indigenous learning, the analysis of the Planea learning tests and their context questionnaires throw some indirect evidence, as well as novel findings.

The presented models managed to explain an important part of the gaps, both by self-identification and by language. The "unexplained" part, which is usually interpreted as the effect of discrimination (in this case, "discrimination + irrelevance of the educational model"), is around 15%. However, as explained below, it is not easy to separate the effects of resources from possible mechanisms of cultural discrimination.

The effect of the ethnic-linguistic composition of the schools, different from that of the socioeconomic composition and different from that of the individual characteristics, is highlighted, which suggests that an important part of the gaps could be due to the cultural characteristics of the school interactions. Surprisingly, once socio-economic factors are controlled, a higher percentage of indigenous people by self-enrollment in school improves the learning of all students, once the socio-economic characteristics are controlled. This result seems counter-intuitive, but it must be remembered that it emerges from maintaining "constant" socioeconomic variables, an exercise whose validity is not exempt from criticism. A possible explanation of this phenomenon is that high percentages of self-identification correspond to communities with higher levels of social cohesion, which, in turn, can favor teaching-learning processes appropriate to the needs of the students.

It also highlights the negative effect that the linguistic composition of the school has, even after controlling for socioeconomic factors. It should be remembered that this composition significantly affects few schools (only 4% of schools have a percentage equal to or greater than 10% of speaking students), so it is a localized phenomenon. In this sense, these effects could be hiding those of other characteristics not observed, such as inadequate teaching practices, lower quality of teachers, or difficulties to advance in the implementation of the curriculum.

Although individual socioeconomic factors manage to explain an important part of the gaps, supporting the hypothesis that socioeconomic inequalities outweigh the eventual effects of cultural discrimination, it is also true that they are not the only ones involved in this explanation. By themselves (adding the individual factors and the aggregate well-being at the school level) they explain between 30 and 60% of the total gaps, with greater effect in language and contrast by auto-enrollment. The student's own school career, on the other hand, explains between 24 and 32% of the differences.

At this point it is important to emphasize that the "individual" trajectory includes events such as disapproval and the formation of educational expectations, over which the influence of mechanisms of discrimination or cultural irrelevance can not be ruled out. In this sense, trajectories are never "individual" because they are conditioned by an educational system that can operate against students from cultural minorities.

Another relevant finding is that in almost all contrasts the schools have a significant incidence, with greater weight in contrast with the speakers for the mathematics test. This incidence is mainly linked to the sector (public vs. private) and to the perception of the classroom climate by the students. Again, in the latter case, the incidence of discriminatory attitudes that affect relations between teachers and students can not be ruled out.

Finally, it is interesting to note that the socio-economic origin and the school environment have a greater weight in the language gaps than in the mathematical ones, and tend to be greater also in the explanation of the contrasts by self-ascription than in the contrasts by language. The first coincides with what has been observed in other research at the regional level, and it would be explained why the learning of mathematics is more dependent on school processes. The second would seem to indicate that - at least as far as evaluated school learning is concerned - speaking students are more dependent on schools to reach them, since it is the only resource they can access. This highlights the need to substantially improve the quality of the school offer received by these students.

In summary, although the analysis allows to affirm that a good part of the gaps between indigenous and non-indigenous people are due to differences in socioeconomic resources, and not to processes of discrimination or to the cultural irrelevance of the educational model, the possible interactions between the factors involved in the learning gap blurs the border between what can be attributed to differences in resources and differences attributable to discrimination processes.

Failure and the formation of educational expectations, in particular, are aspects of the school trajectory that should be addressed more closely, since they can be directly influenced by practices of discrimination or cultural marginalization. Likewise, the fact that indigenous students tend to have better results in schools with a higher proportion of similar students (once socio-economic factors are controlled) suggests that the dispersion of cultural minorities has negative effects on the learning of their members, which podría apuntar a la existencia de

procesos de marginación cultural o de debilitamiento del capital social basado en lazos comunitarios.

On the other hand, at the level of the schools, it is clear that unobserved factors could be affecting significantly and distorting the associations with the observed variables, so in the future it is necessary to develop instruments that make them visible. Above all, it would be necessary to focus on the ability and pedagogical capacity of teachers (one of the most important pending in terms of observation instruments, and also in terms of the Mexican educational policy).

References

1. Backhoff, E., Solano, G., Contreras, L., Vázquez, M. and Sánchez, A. (2015). Are translations adequate to assess the learning of indigenous students? A study with Mayan preschoolers. Mexico: National Institute for the Evaluation of Education.
2. Barriga, R. (2008). Looks at interculturality: the case of an urban school with indigenous children. Revista Mexicana de Investigación Educativa, 13 (39), 1229-1254. Retrieved from https://www.comie.org.mx/revista/v2018/rmie/index.php/nrmie/article/view/597
3. Bastiani, J., Ruiz-Montoya, L., Estrada, E., Cruz, T. and Aparicio, J. (2012). Indigenous educational policy. Teaching practice, castellanization, bureaucracy and centralization of education as limitations of pedagogical success in the Ch'ol region, Chiapas. Educational Profiles, 3 4 (135), 8-25. Recovered from http://www.iisue.unam.mx/perfiles/index.php?numero=135&anio=2012
4. Bertely, M. (2002). Historical overview of education for indigenous people in Mexico. Dictionary of the history of education in Mexico. Mexico: CONACYT / CIESAS .
5. Blinder, AS (1973). Wage discrimination: reduced form and structural estimates. Journal of Human Resources, 8 (4), 436-455. doi: 10.2307 / 144855
6. Cervini, R. (2012). The "school effect" in Latin American countries: reanalyzing SERCE data . Analytical Files of Educational Policies, 20 (39), 1-27. doi: 10.14507 / epaa.v20n39.2012
7. National Council for the Evaluation of Social Development Policy. (2014). Poverty in the indigenous population of Mexico, 2012 . Mexico: Author.
8. Fernández, T. (2007). Distribution of school knowledge: social classes, schools and educational system in Latin America. Mexico: The College of Mexico.

9. Hernández-Zavala, M., Patrinos, H., Sakellariou, Ch. And Shapiro, J. (2006). Quality of schooling and quality of schools for indigenous students in Guatemala, Mexico, and Peru . Working paper No. 3982 on World Bank policy research.
10. National Institute of Statistics, Geography and Information Technology. (2015). Sociodemographic panorama of Mexico. 2015 . Mexico: Author.
11. National Institute for the Evaluation of Education. (2015). Results of the free, prior and informed consultation of indigenous peoples and communities on educational evaluation. Mexico: Author.
12. National Institute for the Evaluation of Education. (2016a). Educational Panorama of Mexico, 2015. National Education System Indicators. Mexico: Author.
13. National Institute for the Evaluation of Education. (2016b). Infrastructure, furniture and educational support materials in primary schools. ECEA 2014. Mexico: Author.
14. McEwan, P. (2004). The indigenous test score gap in Bolivia and Chile. Economic Development and Cultural Change, 53 (1), 157-190. doi: 10.1086 / 423257
15. McEwan, P. and Trowbridge, M. (2007). The achievement of indigenous students in Guatemalan primary schools. International Journal of Education Development, 27 (1), 61-76.
16. Mijangos-Noh, J. (2009). Racism against the Mayan Population in Yucatan, Mexico: How Current Education Contradicts the Law. Paper presented at the Annual Meeting of the American Educational Research Association , San Diego, California. Retrieved from https://files.eric.ed.gov/fulltext/ED505698.pdf
17. Oaxaca, R. (1973). Male-female wage differentials in urban labor markets . International Economic Review, 14 (3), 693-709.
18. Raesfeld, L. (2009). Indigenous children in multicultural schools. Trajectories , 11 (28), 38-57.
19. Raudenbush, SW and Bryk, AS (2002). Hierarchical linear models: applications and data analysis methods (Vol. 1). USA : University of Chicago.
20. Santibáñez, L. (2016). The indigenous achievement gap in Mexico: The role of teacher policy under intercultural bilingual education. International Journal of Educational Development , 47, 63-75.
21. Sakellariou, Ch. (2008). Peer effects and the indigenous / non - indigenous early test - score gap in Peru. Education Economics, 16 (4), 371-390.
22. Schmelkes, S. (2013). Education for an intercultural Mexico. Synectics, 40 , 1-12.
23. Tinajero, G. and Englander, K. (2011). Bilingual-intercultural education for indigenous children: the case of Mexico in an era of globalization and uprisings, Intercultural Education, 22 (3), 163-178. doi: 10.1080 / 14675986.2011.592019

24. Treviño, E. (2013). Learning inequality among indigenous students in Mexico, in B. Jensen and A. Sawyer (Eds.), Regarding education: mexican-american schooling, immigration, and bi-national improvement (pp. 95-123) New York: Teachers College.
25. Villarreal A. (2014). Ethnic identification and its consequences for measuring inequality in Mexico. American Sociological Review, 79 (4), 775-806.
26. According to the National Institute of Statistics and Geography (inegi), speakers of some indigenous language amounted to 6.5% in 2015, and those who self-identify as indigenous reached 21.5% (inegi, 2015).
27. For a sample of Mayan students, Backhoff, Contreras, Vázquez and Sánchez (2015) reported the absence of correlation between familiarity with the Mayan language and performance on a Spanish test.
28. The community courses of the National Council for Educational Promotion (Conafe) were excluded given that they do not have a director's questionnaire, which meant losing relevant information about the schools.
29. The difference in the sample sizes of individuals between the hierarchical models and the decompositions OB responds to the fact that, in the first case, an estimation process was performed with imputation of lost values (through the module mi of Stata) for the variable "Level education ", which amounted to 15.1% of the sample. Each hierarchical model was estimated with a total of five imputations, a criterion with which different exercises showed differences in the coefficients for the third decimal, without differences in the levels of significance being observed. This procedure can not be performed with the OB models because the software does not enable it, so in this case the cases with missing data were eliminated.
30. Some of the school-level variables are observed at the individual level, and are introduced in this way and as aggregates at the school level. This is the case of the index of goods in the home, the classroom climate index, and the two variables that identify indigenous students.
31. The possibility of distinguishing between those who speak an indigenous language and those who identify themselves as such opens interesting perspectives. In the first place, because it "de-essentializes" the indigenous condition and opens up a spectrum of categorization possibilities, and secondly because it separates specifically linguistic aspects from cultural ones. Although self-identification is a controversial criterion because, among other things, it could include a "bias" in favor of subjects with greater cultural capital (Villareal, 2014), it is questionable whether this "bias" is not really part of the phenomenon that is intended observe: indigenous self-identification as the result of a set of relevant cultural dynamics, whose consequences for school processes, rather than being "controlled", must be taken into account as such.
32. For reasons of simplicity, this group is referred to as "speakers".
33. In particular, the set of socioeconomic and school variables of models 3 and 4 is omitted.

34. The decision was made to introduce the variables separately (and not their logical combination as dummies) for the following reasons: 1) Those who declare to have learned an indigenous language first (2.4% of the total) are not a subset of those identified as such: 49.9% of the speakers do not identify themselves as indigenous. 2) This group represents a very low percentage of the total evaluated (1.2%), so it is difficult to analyze them separately. 3) 90.7% of the 13.1 identified as indigenous did not learn to speak an indigenous language first.
35. As part of the previous analyzes, an alternative model was specified with two school variables of institutional type: multigrade school and director with group in charge (# 12 and # 13), none of which was significant.
36. All the coefficients not presented in model 3 show the expected relationship with the learning: the educational level of the parents, the socioeconomic level of the household (at the individual and aggregate levels), the attendance at preschool and the educational expectations are associated with a improvement in learning. On the other hand, to have failed, and to be working (especially outside the home) are associated with a decrease in learning.
37. Three elements are especially noteworthy of the coefficients not presented in model 4: 1) once the socioeconomic and school variables are controlled, the indigenous schools do not show a significant effect; 2) private schools, on the other hand, maintain a strong positive effect; 3) finally, the individual perception of the classroom climate has pronounced positive effects (around 0.14 standard deviations in each of the areas evaluated, for each unit of increase in the index).
38. I performed simulations of results in both tests comparing schools with 12% and 65% of students who identify themselves as indigenous (average percentages for general and indigenous schools, respectively).
39. The exception is that, for reasons of parsimony, and given that the objective of the model is to explain the initial learning gap, instead of identifying possible effects of variables, the percentage of indigenous people was omitted due to the self-identification of the schools, as well as the interactions between individual and school variables.